

Remarks

Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-65 are now pending in this application. Claims 1, 2, 4-11, 31-44, 46-48, 54-60, and 62-65 are rejected. Claims 1, 31, 54 and 58 have been amended. No new matter has been added.

In accordance with 37 C.F.R. 1.136(a), a one-month extension of time is submitted herewith to extend the due date of the response to the Office Action dated April 9, 2004, for the above-identified patent application from July 9, 2004 through and including August 9, 2004. In accordance with 37 C.F.R. 1.17(a)(1), authorization to charge a deposit account in the amount of \$110.00 to cover this extension of time request also is submitted herewith.

Applicants respectfully re-submit a copy of the information disclosure statement (PTO-1449) filed on July 26, 2001. It appears that the information disclosure statement filed July 26, 2001, has not been entered into the record. Applicants respectfully request references cited in the attached PTO-1449 be considered.

The rejection of Claims 1, 2, 4-11, 31-44, 46-48, and 54-65 under 35 U.S.C. § 103(a) as being unpatentable over Bessler et al. (U.S. Patent No. 5,410,230), in view of Alford (U.S. Patent No. 5,220,255) and Kliman et al. (U.S. Patent No. 6,262,550) is respectfully traversed.

Bessler et al. describe a microprocessor (302) that provides a speed or torque control signal via a line (308) to an electronically commutated motor (310) to control the speed or torque of the motor (column 5, lines 45-48). The motor may include means for sensing a position of its rotatable assembly such as a circuit (314) for back electromotive force (BEMF) sensing which provides a speed signal to which the microprocessor is responsive (column 5, lines 55-59).

Alford describes an interface between a thermostat and an electronically commutated motor (ECM) air moving system of an air processing apparatus (column 1, lines 50-52). The interface is adapted to receive the following signals from the thermostat--a fan signal, heat signal, airflow signal and valve signal (column 1, lines 59-61). The interface is coupled to three inputs of the ECM (column 1, lines 61-62). In response to the thermostatic signals, the

interface provides an ENABLE signal, a HEATING signal and a RATE signal (column 1, lines 65-67). The ENABLE signal is coupled to the on/off input of the ECM and operates as an enable/disable control (column 1, line 67 – column 2, line 1).

Kliman et al. describe a Motor Unit (12) that acquires data signals from a Stimulus and Measurement Instrumentation unit (22), which in turn captures signals from sensors that are in contact with a motor or in an immediate vicinity of the motor (column 6, lines 19-22). The Stimulus and Measurement Instrumentation unit in turns reports data extracted from the sensor signals to a computer of the Motor Unit (column 6, lines 13-15).

Claim 1 recites a method for interfacing an electric motor to a controller using an electrical interface circuit, the interface circuit including a controller circuit and a motor control circuit, the controller circuit including a transmitter circuit and a receiver circuit, the motor control circuit including a transmitter circuit and a receiver circuit, and the interface circuit electrically coupled to the controller and the electric motor, the method comprising the steps of “coupling the motor control circuit directly to the electric motor, wherein the motor control circuit is separate from the controller; adjusting a level of a first signal received from the controller that is separate from a thermostat configured to communicate a temperature to the controller; converting the first signal received from the controller to generate a second signal including at least one of an infrared signal and a radio frequency (RF) signal; outputting the second signal to control the electric motor; receiving, by the motor control circuit, a third signal from the electric motor; and transmitting the third signal from the electric motor to the controller.”

None of Bessler et al., Alford, nor Kliman et al., considered alone or in combination, describe or suggest a method for interfacing an electric motor to a controller as recited in Claim 1. Specifically, none of Bessler et al., Alford, nor Kliman et al., considered alone or in combination, describe or suggest coupling the motor control circuit directly to the electric motor, where the motor control circuit is separate from the controller, and receiving, by the motor control circuit, a third signal from the electric motor. Rather, Bessler et al. describe sensing a position of a rotatable assembly of a motor and providing a speed signal representing a speed of the motor to a microprocessor. Alford describes providing an enable signal from an interface located between a thermostat and an electronically commutated motor to an input of the electronically commutated motor. Kliman et al. describe capturing signals, by a Stimulus and Measurement Instrumentation unit, from sensors that are in contact

with a motor and reporting, by the Stimulus and Measurement Instrumentation unit, data extracted from the sensor signals to a computer of a Motor Unit. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests coupling the motor control circuit directly to the electric motor, where the motor control circuit is separate from the controller, and receiving, by the motor control circuit, a third signal from the motor. For the reasons set forth above, Claim 1 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 2 and 4-11 depend, directly or indirectly, from independent Claim 1. When the recitations of Claims 2 and 4-11 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2 and 4-11 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 31 recites an electrical interface circuit comprising “a controller interface circuit configured to communicate signals with a controller, said controller interface circuit including a first transmitter circuit and a first receiver circuit, and further configured to convert a voltage signal to at least one of an infrared signal and an RF signal; and a motor control interface circuit directly coupled to an electric motor and coupled to said controller interface circuit, said motor control interface circuit comprising a second transmitter circuit and a second receiver circuit, is separate from said controller, and configured to receive signals generated by said electric motor.”

None of Bessler et al., Alford, nor Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit as recited in Claim 31. Specifically, none of Bessler et al., Alford, nor Kliman et al., considered alone or in combination, describe or suggest a motor control interface circuit directly coupled to an electric motor and coupled to the controller interface circuit, the motor control interface circuit including a second transmitter circuit and a second receiver circuit, is separate from the controller, and configured to receive signals generated by the electric motor. Rather, Bessler et al. describe a microprocessor that obtains a speed signal representing a speed of a motor. Alford describes an interface that is located between a thermostat and an electronically commutated motor and that provides an enable signal to an input of the electronically commutated motor. Kliman et al. describe a Stimulus and Measurement Instrumentation unit that captures signals from sensors that are in contact with a motor and that reports data extracted from the sensor signals to a computer of a Motor Unit. Accordingly, no combination of Bessler et al., Alford, and/or

Kliman et al. describes or suggests a motor control interface circuit directly coupled to an electric motor, is separate from the controller, and configured to receive signals generated by the electric motor. For the reasons set forth above, Claim 31 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 32-44 and 46-48 depend, directly or indirectly, from independent Claim 31. When the recitations of Claims 32-44 and 46-48 are considered in combination with the recitations of Claim 31, Applicants submit that dependent Claims 32-44 and 46-48 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 54 recites an electrical interface circuit for a HVAC system comprising an electronically commutated motor, the electrical interface comprising “a controller interface circuit configured to communicate signals with a controller, said controller interface circuit including a first transmitter circuit and a first receiver circuit, and configured to convert a voltage signal to at least one of an infrared signal and an RF signal; and a motor control interface circuit directly coupled to an electronically commutated motor and coupled to said controller interface circuit, said motor control interface circuit coupled to said controller interface circuit by using a serial four-wire communications cable, said motor control interface circuit including a second transmitter circuit and a second receiver circuit, is separate from said controller, and configured to receive signals from said electronically commutated motor, said second transmitter circuit including a first optocoupler, and said second receiver circuit including a second optocoupler, said first and second optocouplers configured to isolate signals between said motor control interface circuit and said electronically commutated motor, and said electrical interface circuit configured to interrogate said electronically commutated motor to acquire status and diagnostic information.”

None of Bessler et al., Alford, nor Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit for a HVAC system as recited in Claim 54. Specifically, none of Bessler et al., Alford, nor Kliman et al., considered alone or in combination, describe or suggest a motor control interface circuit directly coupled to an electronically commutated motor and coupled to the controller interface circuit, the motor control interface circuit coupled to the controller interface circuit by using a serial four-wire communications cable, the motor control interface circuit including a second transmitter circuit and a second receiver circuit, is separate from the controller, and configured to receive

signals from the electronically commutated motor. Rather, Bessler et al. describe a microprocessor that obtains a speed signal representing a speed of a motor. Alford describes an interface that is located between a thermostat and an electronically commutated motor and that provides an enable signal to an input of the electronically commutated motor. Kliman et al. describe a Stimulus and Measurement Instrumentation unit that captures signals from sensors that are in contact with a motor and that reports data extracted from the sensor signals to a computer of a Motor Unit. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests a motor control interface circuit directly coupled to an electronically commutated motor, coupled to the controller interface circuit by using a serial four-wire communications cable, is separate from the controller, and configured to receive signals from the electronically commutated motor. For the reasons set forth above, Claim 54 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 55-57 depend from independent Claim 54. When the recitations of Claims 55-57 are considered in combination with the recitations of Claim 54, Applicants submit that dependent Claims 55-57 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Claim 58 recites an electrical interface circuit for a HVAC system comprising an electronically commutated motor, the electrical interface comprising “a controller interface circuit configured to communicate signals with a controller, said controller interface circuit including a first transmitter circuit and a first receiver circuit, said controller interface circuit configured to convert a voltage signal to at least one of an infrared signal and an RF signal; and a motor control interface circuit directly coupled to an electronically commutated motor and coupled to said controller interface circuit, said motor control interface circuit coupled to said controller interface circuit by using a digital wireless interface, said motor control interface circuit including a second transmitter circuit and a second receiver circuit, is separate from said controller, and configured to receive signals from said electronically commutated motor, said second transmitter circuit including a first optocoupler, said second receiver circuit including a second optocoupler, said first and second optocouplers configured to isolate signals between said motor control interface circuit and said electronically commutated motor, and said electrical interface configured to interrogate said electronically commutated motor to acquire status and diagnostic information.”

None of Bessler et al., Alford, nor Kliman et al., considered alone or in combination, describe or suggest an electrical interface circuit for a HVAC system as recited in Claim 58. Specifically, none of Bessler et al., Alford, nor Kliman et al., alone or in combination, describe or suggest a motor control interface circuit directly coupled to an electronically commutated motor and coupled to the controller interface circuit, the motor control interface circuit including a second transmitter circuit and a second receiver circuit, is separate from the controller, and configured to receive signals from the electronically commutated motor. Bessler et al. describe a microprocessor that obtains a speed signal representing a speed of a motor. Alford describes an interface that is located between a thermostat and an electronically commutated motor and that provides an enable signal to an input of the electronically commutated motor. Kliman et al. describe a Stimulus and Measurement Instrumentation unit that captures signals from sensors that are in contact with a motor and that reports data extracted from the sensor signals to a computer of a Motor Unit. Accordingly, no combination of Bessler et al., Alford, and/or Kliman et al. describes or suggests a motor control interface circuit directly coupled to an electronically commutated motor, is separate from the controller, and configured to receive signals from the electronically commutated motor. For the reasons set forth above, Claim 58 is submitted to be patentable over Bessler et al. in view of Alford and Kliman et al.

Claims 59-60 and 62-65 depend from independent Claim 54. When the recitations of Claims 59-60 and 62-65 are considered in combination with the recitations of Claim 58, Applicants submit that dependent Claims 59-60 and 62-65 likewise are patentable over Bessler et al. in view of Alford and Kliman et al.

Moreover, Applicants respectfully submit that the Section 103 rejection of Claims 1, 2, 4-11, 31-44, 46-48, and 54-65 is not a proper rejection. As is well established, obviousness cannot be established by combining the teachings of the cited art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. None of Bessler et al., Alford, nor Kliman et al., considered alone or in combination, describe or suggest the claimed combination. Furthermore, in contrast to the assertion within the Office Action, Applicants respectfully submit that it would not be obvious to one skilled in the art to combine Bessler et al. with Alford or Kliman et al. because there is no motivation to combine the references suggested in the art.

As the Federal Circuit has recognized, obviousness is not established merely by combining references having different individual elements of pending claims. Ex parte Levengood, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993). MPEP 2143.01. Rather, there must be some suggestion, outside of Applicants' disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicants' disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion or motivation to combine the prior art disclosures, nor any reasonable expectation of success has been shown.

Furthermore, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. Further, it is impermissible to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. The present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Specifically, Bessler et al. teach a microprocessor that obtains a speed signal representing a speed of a motor. Alford teaches an interface that is located between a thermostat and an electronically commutated motor and that provides an enable signal to an input of the electronically commutated motor. Kliman et al. teach a Stimulus and Measurement Instrumentation unit that captures signals from sensors that are in contact with a motor and that reports data extracted from the sensor signals to a computer of a Motor Unit. Since there is no teaching nor suggestion in the cited art for the combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection of Claims 1, 2, 4-11, 31-35, 40-44, 46-48, and 54-65 be withdrawn.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1, 2, 4-11, 31-44, 46-48, and 54-65 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'Robert B. Reeser, III', written over a horizontal line.

Robert B. Reeser, III
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070